

On the Development of Aesthetic Education of High-level University of Science and Engineering under the Background of Emerging Engineering Education: Current Situation, Problems, and Countermeasures-Based on investigation and Analysis of 15 Science Technology Universities

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Abstract: Facing a new round of scientific and technological revolution and industrial reform, China science technology universities try to develop emerging engineering education construction in order to cultivate diversified and innovative outstanding engineering talents. Many studies show that the cultivation of individual innovation ability cannot be separated from perceptual education represented by aesthetic education. In order to stimulate students' innovation potential and improve the innovation ability of outstanding engineering talents, this study selected 15 high-level science technology universities in China as research objects. Through collecting, sorting out, and analyzing the "Annual Report on the Development of Art Education" and relevant aesthetic education materials of 15 science technology universities in recent five years, it is found that China's high-level science technology universities have made great progress in the construction of aesthetic education organization, curriculum setting, teacher resources construction, system construction, aesthetic education form, and aesthetic education quality. However, at the same time, there are many problems, such as the quantity difference of aesthetic education curriculum, and lack of systematic planning of curriculum content; insufficient combination of aesthetic education idea and emerging engineering talent cultivation idea; low level of aesthetic education activity, and the breadth and depth of aesthetic education practice are needed to be improved. Aiming at these problems and combining with the goal of emerging engineering education construction, this study tries to discuss the relevant strategies to improve the aesthetic education level of high-level science technology universities from three aspects: establishing pragmatism aesthetic education view, forming aesthetic education system with professional characteristics, and constructing cooperative education mechanism of aesthetic education.

1. Introduction

The construction of emerging engineering education is an education reform activities to cultivate diversified and innovative engineering talents in the future, which is guided by virtue-building, with the construction idea of dealing with change and shaping the future, with inheritance and innovation, intersection and integration, coordination and sharing as the main way [1]. In 2017, the Ministry of Education of China began to implement emerging engineering education research and practice in the field of higher education in order to meet the challenges of a new round of scientific and technological revolution and industrial reform, and to guide universities to actively serve innovation-driven development and major national strategies such as "the Belt and Road", "Made in China 2025" and "Internet+". As an important support unit of engineering education in China, science technology universities are the cradle of training outstanding engineering talents and pioneers in the research and practice of emerging engineering education. In recent years, under the background of emerging engineering education, the research on talent cultivation in science technology universities has been emerging, but most of them discuss about the curriculum system and teaching mode of science technology universities, but less research on humanities quality of

engineering talents, especially the aesthetic education research of training perceptual thinking and artistic accomplishment. In fact, aesthetic education plays an irreplaceable role in cultivating innovative engineering talents. Aesthetic education can stimulate innovation potential by developing human's perceptual acuity, emotional richness, and imagination freedom [2]. Further, it can improve the innovation ability of engineering technicians in terms of adaptability, observation, practical action, concentration, imagination, rational analysis, and criticism [3]. In 2020, the General Office of the State Council of the People's Republic of China issued the "Opinions on Comprehensively Strengthening and Improving the Aesthetic Education of Schools in the New Era". It is clearly pointed out that aesthetic education is an education that enriches imagination and cultivates innovative consciousness, which can improve aesthetic literacy, cultivate sentiment, warm the mind, and stimulate vitality of creativity. Therefore, science technology universities should not only teach direct engineering technical knowledge, but also pay attention to the edification of humanistic knowledge represented by aesthetic education. In view of this, this paper selects 15 high-level science technology universities in China as the object of investigation, through analyzing the "Annual Report on the Development of Art Education" and other public information about aesthetic education in these schools in recent five years to understand the present situation of aesthetic education activities in domestic science technology universities, analyzes the problems existing in aesthetic education activities, and puts forward countermeasures for aesthetic education development based on the background of emerging engineering education construction.

2. Conceptual Definition and Research Methods

The high-level science technology universities in this article mainly refer to the science technology universities that have been selected into the national "Double-first Class" construction rank. Most of these universities have been selected into "Project 211". Some of them are still national Project 985 universities, which are the cradle of cultivating outstanding engineering talents in China, with high social reputation and recognition, and can represent the development level of domestic science technology universities. Because of the historical reasons and the single feature of its own discipline structure, science technology universities attach great importance to professional knowledge and skills education during a long period of running schools, and there are widespread defects in humanities education, especially in art education, which lag professional education greatly [4]. Therefore, under the background of emerging engineering education construction, it has important practical significance to select and research aesthetic education closely related to the growth of innovative outstanding technical talents. Through collecting the "Annual Development Report of Art Education" and other relevant information of these 15 universities, using data statistics, literature analysis and other research methods to sort out the information content, collect the aesthetic education activity data of domestic high-level science technology universities in recent five years, and use it to analyze the status quo of aesthetic education of such universities.

3. Status Quo of Aesthetic Education in High-Level Science Technology Universities

It has been a long time trying to integrate aesthetic education into the cultivation of engineering and technical talents. Huazhong University of Science and Technology established the Aesthetic Education Department as early as the middle of 1980s and built "Music Center" Building [5]. In 1995, Huazhong University of Science and Technology issued "Decision on Improving Humanistic Literacy of Our University Students and Chinese Language Level". Mr. Yang Shuzi, President, advocated the integration of science education and humanities education, and took the lead in carrying the banner of cultural quality education among national science technology universities. The idea of humanistic quality education in Huazhong University of Science and Technology indicates that the science technology universities has realized that the perceptual thinking of humanistic education plays an important role in stimulating the creative potential of students in science technology. Entering the 21st century, humanistic quality education has been paid more and

more attention. In 2014, the “Working Regulations of School Art Education” and “Several Opinions of the Ministry of Education on Promoting the Development of School Art Education” were issued successively, and aesthetic education was formally incorporated into the evaluation of the quality of running schools in colleges and universities. Under this background, aesthetic education of science technology universities developed rapidly and achieved a series of achievements.

3.1. The Aesthetic Education Organization is Sound and the Organization Forms are Diversified

The aesthetic education in colleges and universities is not only facing the whole students, but also needs the cooperation of many departments in the university. Therefore, it is an important measure to set up the organization reasonably. Through comprehensive analysis of the construction of aesthetic education organizations of 15 high-level science technology universities, it can be found that each school has set up aesthetic education management or teaching institutions with rich and diverse organizational forms. According to the differences in the forms of institution construction, they are divided into three categories: the first category is unified management. The Art Education Guiding Committee shall be established by the university, and the school leader shall be responsible for acting as the director of the committee. The committee members are mainly responsible persons of the Academic Affairs Office, Student Affairs Department (Office), Personnel Office, Labor Union, Art Education Center, etc. The Academic Affairs Office is responsible for arranging the development of aesthetic education courses, and other departments are responsible for assisting. Such schools include Wuhan University of Technology. The second category is the cooperation between the two parties. Some colleges and universities have art departments. Such colleges and universities will set the Administrative Department of Public Arts courses in the Academic Affairs Office. The teaching institutions of the arts courses are located in the Art Institute (or Department), and the Academic Affairs Office, Student Work Department (Office), League Committee, Propaganda Department, etc. constitute the artistic education cooperation system, which promotes the development of aesthetic education through division of labor and cooperation. Such universities include Northeastern University, etc. The third category is multiple participation. The Arts Department of the university is responsible for the teaching of public courses of art; the Art Education Center is responsible for the teaching of the elective courses of art, the guidance of students’ extracurricular art education activities, the business guidance of student art associations, and the construction of cultural quality education base for college students; the League Committee of the university is mainly responsible for the construction of the College Students Art Troupe, mass cultural and artistic activities, and the construction of campus cultural and artistic atmosphere. This model has clear division of labor and clear responsibilities, such as Beijing Institute of Technology. These three forms of aesthetic education organization preliminarily include the basic pattern of the construction of aesthetic education organization in colleges and universities. The unified management is conducive to concentrating limited resources to coordinate the development of the school-wide aesthetic education activities; The cooperation between the two parties has realized the cooperation between management and teaching, relieved the pressure of the Academic Affairs Office as the aesthetic education management department, and provided professional guidance for the development of aesthetic education activities. The multiple participation system maximizes the enthusiasm of each department to participate in aesthetic education activities, which helps to realize the whole staff education and all-round education.

3.2. The Aesthetic Education Curriculum is Complete and the Coverage of the Curriculum is Expanding Constantly

In recent years, schools have actively strengthened the construction of arts courses in accordance with the spirit of relevant documents of the Ministry of Education. In the course setting of aesthetic education curriculum, each school pays attention to students’ interests, improving students’ artistic accomplishment as the core, emphasizing the aesthetics and practice experience of art, respecting the individual differences and different choices of students’ artistic level, and attaching importance to the connection with the middle school art curriculum. By optimizing the curriculum setting of art

education and perfecting the curriculum system of art education, the seamless connection between the first class and the second class of aesthetic education is realized, and the quality of curriculum construction is steadily improved, to realize the goal of cultivating outstanding engineering talents. Among the 15 high-level science technology universities surveyed, there were 10 universities with more than 10 courses in art education courses, covering music, art, drama, Chinese folk music, dance, film and television, calligraphy, etc. With the richer and richer aesthetic education curriculum, students' enthusiasm for elective aesthetic education courses has been greatly improved, and the coverage of aesthetic education courses in colleges and universities has been constantly expanding. Taking Wuhan University of Technology as an example, only in 2014, more than 14,000 students elected in art courses.

3.3. The Construction of Aesthetic Education Teachers is becoming more and More Professional, and the Overall Level of Teachers has been Significantly Improved

According to the investigation, there are three main sources of aesthetic education teachers in science technology universities. Firstly, the full-time teachers of the Arts Education Center in university, who are specially responsible for the public art education of the school; secondly, the school art majors or faculty teachers take part-time jobs to undertake the school aesthetic education work; and thirdly, from the social level, externally employ some professional technical personnel with relevant qualifications to participate in the school aesthetic teaching work. Since the system of "Annual Report on Art Education Quality" has been carried out, the construction of aesthetic teachers in most colleges and universities is becoming more and more specialized, and the number of full-time art teachers is increasing constantly. With the increase of the number of teachers, the quality of art teachers is constantly improving. Teachers' professional skills have made rapid progress, and many teachers have won various awards. Teachers' enthusiasm to participate in aesthetic education research at the same time of aesthetic teaching is increasing, and teachers' aesthetic education and research achievements are rich.

3.4. The Construction of Aesthetic Education System Provides Guarantee for the Continuous Development of Aesthetic Education Activities

The continuous and effective development of aesthetic education activities in colleges and universities cannot be separated from the guarantee of various regulations. According to the investigation of 15 high-level science technology universities, in order to guarantee the orderly advancement of aesthetic education activities, colleges and universities have formulated many management systems around such educational activities as art teaching, aesthetic education and general education. For example, Wuhan University of Technology promulgated the "Administrative Measures for General Education Elective Courses of Wuhan University of Technology (Trial)" in 2014, which stipulates five general courses such as humanities and social sciences, and arts and sports shall be set, and the minimum credits for full-time undergraduates to choose relevant general education elective courses including art courses are specified. In 2019, the University of Electronic Science and Technology of China promulgated the "University of Electronic Science and Technology of China Implementing Rules for Strengthening the Aesthetic Education of Schools in the New Era", established the Special Committee for Aesthetic Education, defined the working mechanism, and stipulated the required credits for aesthetic education courses. It laid a solid foundation for the further deepening development of aesthetic education from the aspects of curriculum construction, community construction, and teachers' team construction, promotion of cultural inheritance and innovation, and enhancement of social service ability.

3.5. The Aesthetic Education Forms are Diversified and the Overall Quality of Aesthetic Education is Continuously Improved

Based on the analysis of the "Annual Report on Art Quality", it can be concluded that there are many other forms of aesthetic education while developing aesthetic education in universities. These aesthetic activities improve the quality of aesthetic education in schools from different angles and in different ways. Based on the first class of aesthetic education, the second class with its own

characteristics is developed. For example, to develop the school's artistic education characteristics, Wuhan University of Technology has established 17 college students' art associations under the responsibility of the School League Committee, formulated special management system, equipped with full-time instructors, standardized and directed the work of art associations, and promoted the artistic accomplishment of university students. Beijing Institute of Technology, relying on the regional advantages of Beijing as the national cultural center, took advantage of the activities resources such as "Elegant Arts Entering Campus" of Ministry of Education, "National Arts Entering Campus" of Beijing Municipal Education Commission, and other activities resources, and established extensive and in-depth cooperative relations with such cultural and artistic institutions as the National Centre for the Performing Arts, China Philharmonic Orchestra, China National Opera House, the Northern Kunqu Opera Theater, National Museum of China, Central Conservatory of Music, etc. It helped teachers and students to experience, understand and appreciate art through various elegant art activities. The University of Electronic Science and Technology of China organized students to participate in various art competitions by means of "racing to promote learning and racing to promote teaching". Only in 2019, the Art Troupe won 5 international awards, 1 national award, and 11 provincial awards in domestic and foreign art competitions. By participating in the competition, the students' aesthetic vision and aesthetic ability are improved.

4. Problems in the Development of Aesthetic Education in High-level Science Technology Universities

4.1. Relationship between High-level Science Technology Universities and Aesthetic Education in Emerging Engineering Education Background

The emerging engineering education is a higher education which aims at cultivating diversified and innovative talents of outstanding engineering science and technology. In recent years, many scholars have studied the quality structure of emerging engineering education talents. Chen Min and others believe that the cultivation of outstanding engineering talents should not only allow students to construct profound engineering knowledge, but also guide students to master relevant knowledge of humanities and social sciences and basic disciplines, and can think comprehensively from the perspectives of technology, ethics and even aesthetic art, to lay a foundation for technological innovation [6]. Xiang Cong thinks that the cultivation process of engineering technical talents is the process of striving to realize "all-round development of human beings". The growth of engineering talents should not only achieve complete development in respects of morality, intelligence, physical, and aesthetic, but also need to obtain more coordinated development among various basic qualities, so that it not only masters knowledge and skills, but more importantly acquires independent personality and innovative spirit [7]. Facing Long-Range Objectives through the Year 2035, Wang Shibin et al. pointed out that the core competence of emerging engineering talents is the key ability expressed through behavior in the engineering situation, which is mainly composed of three types of capabilities: general capability, specialized ability, and engineering capability. Four kinds of carriers are needed to cultivate these capabilities, including humanities, arts, and social sciences [8]. From the research of these scholars, it is easy to find that aesthetic education can play an important role in stimulating the innovation potential of engineering students. The facts also show that aesthetic education plays an important role in promoting the development of image thinking, imagination, abstract thinking, and even intellectual education [9]. Aesthetic education with art education as the core is of great significance for talent cultivation of engineering technology. Under the background of emerging engineering education, engineering talents are not only the "one-dimensional person" of technology. The diversified and innovative outstanding engineering talents are all-round people with morality, intelligence, physical, aesthetic, and labor. Their core qualities and talent standards already include the ability to appreciate and create beauty. Therefore, it is strongly related to stimulate the innovation potential of engineering talents and aesthetic education, which is also one of the core problems of "emerging engineering" education [10]. Developing

aesthetic education is the meaning of emerging engineering education.

4.2. Problems in Aesthetic Education of High-Level Science Technology Universities under the Background of Emerging Engineering Education

With reference to the objective requirements of emerging engineering education construction on the aesthetic ability of outstanding engineering talents, through analyzing the development of aesthetic education activities of 15 Chinese high-level science technology universities in recent five years, we can find out that there are three outstanding problems in aesthetic education of high-level science technology universities under the background of emerging engineering education.

4.2.1. The Number of Aesthetic Education Courses Varies Greatly, and the Content of the Curriculum Lacks Systematic Planning

The art course is an important carrier and main form of aesthetic education activities in science technology universities. By sorting out the situation of aesthetic education courses offered by 15 science technology universities, it can be found that although they are all science technology universities, there are great differences among schools in the number of art courses offered. Among them, the universities that offer the most art courses are Northeastern University. Only in the academic year of 2020, Northeastern University offered 108 courses of art-like elective courses, covering music, painting, calligraphy, photography, dance, instrumental music, pottery, animation, drama, literature, etc. However, in the same year, North China Electric Power University, which is the same science technology university, offered only 7 elective courses of art, covering four categories of music, dance, drama, and film and television. Besides the uneven number of aesthetic education courses, the lack of systematic planning and fragmentation of curriculum content is another outstanding problem facing aesthetic education in science technology universities. At present, there is a lack of systematic and diversified aesthetic education textbooks in the classroom of aesthetic education in colleges and universities. The courses of aesthetic education in colleges and universities are basically composed of the art courses of “patchwork type”, and the selection and setting of these art courses have not been systematically demonstrated. Therefore, the students accept more fragmented art knowledge and difficult to form a thinking system.

4.2.2. The Combination of Aesthetic Education Idea and Talent Cultivation Concept of Emerging Engineering Education is not in Place

As mentioned above, emerging engineering talents must firstly develop all-round in morality, intelligence, physical, aesthetic, labor, and other aspects. Carrying out aesthetic education is the basic work of cultivating outstanding engineering talents. However, this does not mean that aesthetic education of science technology universities is independent of outstanding engineering technical personnel training activities. On the contrary, because aesthetic education plays an important role in promoting the development of image thinking, imagination, abstract thinking and even intellectual education, and also plays an important role in stimulating the innovation potential of engineering students, in order to cultivate emerging engineering talents, aesthetic education should be closely combined with the cultivation of innovation consciousness of engineering and technical talents. Some scholars have put forward to use aesthetic education to add “technological beauty” factor in the construction education of “emerging engineering education”, so that it has design aesthetic ability [10]. Through the analysis of the aesthetic education activities of 15 science technology universities, it is found that although some schools have set up some aesthetic education courses combined with the majors, for example, the School of Architecture and Arts of Hefei University of Technology combines Huizhou cultural characteristics with architecture, urban and rural planning, landscape architecture, industrial design, environmental design, and visual communication design, which not only improves students’ professional skills but also enhances their aesthetic taste. However, at present, the aesthetic education mode like Hefei University of Technology is still out of scale. Most colleges and universities don’t combine scientific spirit, humanistic quality, and artistic position in practice, and there is no synergy between aesthetic education and engineering technical talents cultivation.

4.2.3. The Level of Aesthetic Education Activity is Low, and the Breadth and Depth of Aesthetic Education Practice need to be Improved

Aesthetic education serves the cultivation of outstanding engineering talents mainly by promoting the aesthetic taste of talents, stimulating aesthetic inspiration, improving the ability of creation and innovation of engineering talents, adding a layer of “technological beauty” to the talent cultivation of emerging engineering talents, and making the value orientation of talents realize the balance between instrumental rationality and value rationality. According to the situation of aesthetic education activities in 15 high-level science technology universities, it can be found that the construction of aesthetic education organization, curriculum establishment, teachers allocation, fund investment, and facilities purchase of major universities have become increasingly mature in recent five years. These conditions provide a solid foundation for the development of aesthetic education and more convenient conditions for students to perceive art. However, under the condition of improving the aesthetic ability, the ability of creating beauty has not been promoted because of the improvement of the infrastructure conditions. The aesthetic education activities of colleges and universities are still in the first stage—cultivating aesthetic ability. The level of aesthetic education activity is lower. The practice of students’ aesthetic education in colleges and universities is mainly the artistic activities organized by the major art associations, participating in art competitions inside and outside the campus. Although these activities are attended by students themselves, there are, after all, fewer students participate in such activities and insufficient coverage; moreover, the quality of the art activities held in various schools is uneven. Compared with the higher elegant arts entering the campus, the elegant arts in the campus appear to be incomparable.

5. Suggestions on the Development of Aesthetic Education of High-level Science Technology Universities in the Background of Emerging Engineering Education

From “Fudan Consensus”, “Tianjin University Action” to “Beijing Guideline”, the construction of emerging engineering education in China’s higher education field has been in full swing for nearly five years from consensus formation, clear course of action to wide popularization. Over the past five years, academic circles have increasingly recognized that perceptual education represented by aesthetic education plays an irreplaceable role in stimulating the innovation potential of engineering students through developing image thinking. Aesthetic education, as an important support for the growth of outstanding engineering talents, has been included in the evaluation of undergraduate teaching work and the evaluation index system of “Double-first Class” construction. However, in the process of deep integration of professional education and aesthetic education, domestic universities still have multiple difficulties in understanding, mechanism, and means [11]. How to play the role of aesthetic education in the process of talent cultivation of outstanding engineering technology more efficiently should be started from the following three angles.

5.1. Set up Pragmatism View of Aesthetic Education

After the revolution of computer technology and the industrialization of Internet, the construction of emerging engineering education was put forward under the background that human development faced a new round of technological innovation stage. The most important characteristic of the emerging engineering talents in the new technological and industrial environment is that they have the ability of innovation and cross-border integration. Aesthetic education, which aims at cultivating aesthetic ability and training aesthetic sense, should also keep pace with the development of the times and establish the view of pragmatism aesthetic education. There are two aspects to establish the concept of pragmatism aesthetic education: firstly, attach importance to the important role of aesthetic education in the development of engineering talents. With the development of emerging technology, engineering talents must be an all-round development person. Therefore, talents cultivation in science technology universities should not only pay attention to intellectual education represented by professional technology, but also pay attention to the function of other educational activities such as aesthetic education on individual

growth, firmly establish the educational concept of “five-education carried out simultaneously” and establish the value orientation of instrumental rationality and value rationality. Secondly, the aesthetic education of science technology universities should not only stay on the teaching of artistic knowledge and the inheritance of aesthetic experience, but should combine the ability of creating beauty with the creative personality needed by outstanding engineering talents. The pragmatism aesthetic view determines that aesthetic education can not only transform students’ vision to the world, but also provide guidance for students to transform the material world.

5.2. Form Aesthetic Education System with Professional Characteristics

The education of science technology universities mainly focuses on teaching professional technical knowledge and solving technical problems, which is rational; the teaching of art education is the humanistic knowledge related to the freedom of the mind and solving spiritual problems, which is perceptual. Only the perfect combination of rationality and perceptually can we improve people’s creative thinking ability to the greatest extent [12]. Students of science technology universities enrich their personal emotions and improve their aesthetic ability through aesthetic education to stimulate their creative potentials in their work, and make them become versatile and innovative engineering talents. How to make students’ innovation potential to improve their professional ability needs to form an aesthetic education curriculum system with professional characteristics. University of Electronic Science and Technology of China has made many beneficial attempts in this field. Focusing on the overall goal of school aesthetic education, the University of Electronic Science and Technology of China further decomposes the specific target into three aspects of promoting students’ perceptual development, personality perfection and advanced innovation. Build an aesthetic education system of “curriculum education + art infiltration + innovation potential activation” for engineering students around specific goals. With reference to the aesthetic education experience of the University of Electronic Science and Technology of China, the construction of aesthetic education system with specialty characteristics can be started from the following three aspects: Firstly, embed the aesthetic education curriculum into the cultivation scheme of engineering specialty, and construct the “trinity” curriculum system of general aesthetic education course, professional characteristic aesthetics course, and advanced course of engineering aesthetics; secondly, build the artistic experience space and artistic practice platform that travels with beauty to make engineering students get three-dimensional and immersive art infiltration; thirdly, cross-disciplinary and cross-school cooperation promotes cross-border integration of science and technology and art, such as building “science and technology + art” auxiliary major with well-known enterprises in the industry, and establishing cross-border research center for science and technology and arts.

5.3. Construct the Cooperative Education Mechanism of Aesthetic Education

The achievement of aesthetic education goal of science technology universities is not accomplished in one action, nor can be accomplished by a certain department alone. It is necessary to construct a collaborative education mechanism of aesthetic education. Specifically, there are two aspects of collaboration: Firstly, vertical coordination, that is, aesthetic education activity is not the thing that needs to be paid attention to only when the school develops to a certain stage, nor is it the thing that students should finish in which grade. The aesthetic education in colleges and universities needs to be promoted continuously. The aesthetic education planning and implementation work should be consistent with the overall development plan of the school. The arrangement of aesthetic education activities should be coordinated with the whole learning and growth career of students. Secondly, horizontal coordination. It is necessary to strengthen high-level overall planning, establish a leading group with university leaders as the core, coordinate with relevant departments of the school to plan, guide, coordinate, and supervise aesthetic education work, formulate school-level aesthetic education plan and program, ensure the completion of aesthetic education objectives and tasks with high quality; meanwhile, strengthen the interaction inside and outside the school. Not only carry out the exchange of aesthetic education experience with the same type of colleges and universities, but also need to cooperate with other art colleges and universities to share aesthetic

education resources, promote the aesthetic education work through co-establishment of science and technology art innovation platform and mutual employment of aesthetic teachers.

6. Conclusions

The high-level science technology university is the main position of promoting the construction of emerging engineering education and the cultivation mode of innovative engineering technology personnel in China. After nearly five years of research and practice of emerging engineering education construction, science technology universities increasingly realize that aesthetic education plays an important role in promoting students' perceptual thinking ability and stimulating students' creative thinking. Through the investigation of the present situation of aesthetic education in 15 high-level science technology universities, it is found that these universities have made great progress in the construction of aesthetic education organization, curriculum setting, teachers construction, system construction, aesthetic education form, and aesthetic education quality, but there are also some problems. With the further development of emerging engineering education construction, science technology universities should establish pragmatism view of aesthetic education, form an aesthetic education system matching with specialty characteristics (or school characteristics), construct cooperative education mechanism of aesthetic education, and innovate excellent engineering talent cultivation mode while improving aesthetic education quality.

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